NON-FINAL OFFICE ACTION

In view of the Appeal Brief filed on 6/9/2008, PROSECUTION IS HEREBY REOPENED. New grounds of rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

/Rodney Bovernick/

Supervisory Patent Examiner

Art Unit 2874

Response to Arguments

Applicant points out that "distributed fiber optic point sensor" in the Examiner's rejection made on 1/4/2008 should be "distributed fiber optic sensor". Examiner agrees and the following rejection reflects the correction.

Applicant argues that the terms "fiber-optic point sensor" and "distributed fiber-optic sensor" are disclosed in Applicant's specification at page 6, lines 1-5, and those terms are well known to those having ordinary skill in the art.

Examiner notes that Applicant only discloses that fiber-optic point sensors could be geophones as an example (Applicant's specification at page 6, lines 1-5), and the distributed fiber optic sensors preferably comprise optical fiber packages for measuring pressure on, or bend, of the distributed sensors (Applicant's specification at page 4, second paragraph). Applicant fails to establish any definition of "fiber-optic point sensors", or "a distributed fiber-optic sensor" in the specification. Applicant only gives an example of the fiber-optic point sensor, and the preferable structure of the "distributed fiber-optic sensor" in the specification.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-10, 15, and 16 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Knudsen et al (USPAT 6,575,033).

Knudsen et al disclose an optical device comprising: at least two fiber-optic point sensors 22, 24 in fig. 2; and

Distributed fiber-optic sensor 23 linking said at least two fiber-optic point sensors 22, 24, wherein said sensor array provides an array output of sensed data from said at least two fiber-optic point sensors and said distributed fiber-optic sensor (see that the existence of the signal converter 40 and signal processing equipment 55 reflects that the sensor array provides array output of sensed data).

In re claim 2-4, Knudsen et al teach at column 5, lines 10-15 that the structure 10 may be subjected to be interrogated, in fig. 2 the fiber-optic cable 28, and at column 2, line 51, a transducer (abstract) and a wire cable (electrical strain gauge can be utilized, see column 16, line 51).

In re claim 5, fig. 5 and 6 shows that the optical fiber wound into a flexural disc.

In re claims 6 and 7, Knudsen et al show at column 3, line 52-55 that the fiber optic point sensors are for measuring seismic data (geophone), and accelerometer.

In re claim 8, Knudsen et al show at column 7, lines 39-54 that in the accelerometer 22 the effective scale factor can be described in terms of the strain (pressure) applied to the fibers.

In re claim 9, Knudsen et al show in abstract that interferometric system is utilized.

In re claim 10, Knudsen et al show at column 15, lines 52-65 that Michaelson Interferometer (reflectometric interferometer) can be utilized.

In re claims 15 and 16, Knudsen et al show all the claimed structural limitations, and the claimed method steps are inherently done by Knudsen et al device for the purpose of measuring and analyzing the optical signal.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knudsen et al in view of Cranch et al ("Large-Scale Multiplexing of Interferometric Fiber-Optic Sensors Using TDM and DWDM", Journal of Lightwave Technology, Vol. 19, No. 5, May 2001, Cranch et al, pp 687-699).

Knudsen et al disclose every aspect of claimed invention except for the pulsed reflectometric interferometric system (claim 11) employing time-division multiplexing (claim 12). Note that Knudsen et al teach at column 16, lines 60-end that any strain sensors, optical fibers may be attached to the elastic support members.

Cranch et al show the general teaching of utilizing the pulsed reflectometric interferometric system employing time-division multiplexing for the purpose of individual sensor signals to be distinguished in the multiplexed array (see page 687, right column, line 1-2).

Therefore, it would have been obvious to the person having ordinary skill in the art at the time the invention was made to modify Knudsen et al device to include the pulsed reflectometric interferometer as shown in Cranch et al for the purpose of individual sensor signals to be distinguished in the multiplexed array. It is clear that this would improve the device.

Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knudsen et al in view of Kleinerman (USPAT 5,991,479).

Knudsen et al disclose every aspect of claimed invention except for the pulsed Rayleigh-backscatter interrogation system. Note that Knudsen et al teach at column 16, lines 60-end that any strain sensors, optical fibers may be attached to the elastic support members.

Kleinerman shows the general teaching of utilizing the pulsed Rayleigh-backscatter interrogation system.

It would have been obvious to the person having ordinary skill in the art at the time the invention was made to modify Knudsen et al device to include the pulsed Rayleigh-backscatter interrogation system as shown in Kleinerman for the purpose of measurement of temperature and/or forces distributed over many locations,

simultaneously and with a single fiber probe (see column 5, lines 1-9). It is clear that this would improve the device.

Conclusion

In formation regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

For all official patent application related correspondence for organizations reporting to the Commissioner of Patents:

- Correspondence that is transmitted by facsimile must be directed to the central facsimile number, (703) 872-9306.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Further references of interest are cited on Form PLO-892, which is attachment to this office action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ellen Kim whose telephone number is (571) 272-2349. The examiner can normally be reached on Monday through Thursday.

/Ellen Kim/
Primary Examiner,
Art Unit 2874
October 2, 2008/EK